PostScript

LETTER

Are there socioeconomic differentials in under-reporting of smoking in pregnancy?

Letters intended for publication should be a maximum of 500 words, 10 references, and one table or figure, and should be sent to the editor at the address given on the inside front cover. Those responding to articles or correspondence published in the journal should be received within six weeks of publication

Self reported smoking status is the primary measure of smoking status for research and policy, providing both a cheaper and more widely accepted indicator than biochemical validation. It is employed in observational studies where analyses seek to explain how socioeconomic background exerts an influence on smoking behaviour. Self report is used, too, for evaluating the effects of population based tobacco control policies and for assessing progress against national and state level targets to reduce smoking prevalence.

For the general population, self reported measures have been found to provide reliable estimates of smoking status when cotinine validated,[1 2] without systematic differentials in under-reporting by socioeconomic group.[3 4] However, self report is a less reliable measure for the pregnant population, where smokers can feel under greater pressure to describe themselves as non-smokers. For this population, validated prevalence rates have been found to be substantially higher than self reported rates.[5 6] A related, but neglected, question is whether rates of under-reporting vary between socioeconomic groups.

Answering the question of whether there is a misclassification bias in the primary measure of smoking status in pregnancy is important for smoking research and tobacco control policy. It is particularly important for monitoring socioeconomic trends in smoking in pregnancy, and for evaluating the effectiveness of policies to reduce prevalence in lower socioeconomic groups.

We examined under-reporting by socioeconomic group in a British pregnancy study with information on self report and biochemical smoking status, and on socioeconomic status. The study was based on a national quota survey of 1009 pregnant women in England, conducted in 1999. Participants were located by doorstep screening, with quotas set to match the age and social class profile of the general population of women of childbearing age (15–44 years). Data were collected in home interviews. Rates of current smoking by age and socioeconomic factors were in line with other population surveys. Full details of the sampling and methods are published elsewhere.[7 8]

Those participants who answered ''yes'' to the question ''Do you smoke cigarettes at all nowadays?'' were defined as smokers. Cotinine validation was provided using saliva samples collected at the end of each interview, using standard methods and with cotinine concentration determined by gas chromatography.[9] Dichotomous measures of socioeconomic group were constructed from data on occupation of main earner (non-manual/manual), age left full time education (15–16/⩾17) and housing tenure (owner occupied/rented). χ^2 was used to test whether differences between self reported and cotinine validated smoking rates differed by socioeconomic group.

A total of 832 respondents (82.5%) provided a saliva sample for cotinine analysis. Of these, 585 (70.3% or 58.0% of the full sample) provided a useable sample. The provision of a saliva sample was not associated with self reported smoking status, age, or socioeconomic group. The optimal cut-off level for discriminating between smokers and non-smokers using saliva cotinine is 14.2 ng/ml.[10] Seventeen non-smokers had values above the cut-off of ⩽ 14 ng/ml.

Table 1 Smoking prevalence by social class, age left full time education, and housing tenure

	Self report (%)	Cotinine validated (%)	Absolute difference†	Relative difference‡	Base (No.)§
*Social class**					
Non-manual	11.6	14.7	3.1	3.6	(251)
Manual	43.3	46.0	2.7	4.9	(326)
*Age left full time education**					
15–16	41.5	44.4	2.9	4.9	(311)
⩾17	15.1	18.1	3.0	3.6	(265)
*Housing tenure**					
Own/mortgage	14.2	17.1	2.9	3.4	(339)
Rent	52.5	55.3	2.8	5.8	(219)

*χ^2(1 df) p>0.05, not significant. Based on comparison of number of smokers before and after biochemical validation.
†Absolute difference based on difference in rates before and after biochemical validation.
‡Relative difference based on percentage of self reported non-smokers who failed biochemical validation.
§Base not consistently = 579 due to item non-response.

In line with other studies, validated prevalence rates were higher than self reported rates in all socioeconomic groups (table 1). The proportion of self reported smokers who were reclassified as smokers following cotinine validation was also similar across socioeconomic groups on all measures. There were no significant differences in rates of under-reporting in pregnancy by occupational class, education or tenure (table 1).

Our study suggests that, as in the general population, the use of self reported smoking status will not introduce systematic biases into explanatory studies seeking to understand why there are socioeconomic gradients in smoking in pregnancy. It indicates, too, that, with appropriate adjustment for under-reporting evident in all socioeconomic groups, self reports can be used in policy oriented studies to monitor socioeconomic trends in smoking in pregnancy, and to evaluate the impact of interventions on socioeconomic differentials in smoking status.

A limitation of the study is its sample size and its restriction to one national population. Further studies with appropriate measures of smoking status and socioeconomic status are recommended to confirm the generalisability of our finding.

H Graham
Lancaster University, Lancaster, UK

L Owen
Health Development Agency, London, UK

Correspondence to: Hilary Graham; h.m.graham@lancaster.ac.uk

References

1 **Patrick DL**, Cheadle A, Thompson DC, *et al.* The validity of self-reported smoking: a review and a meta-analysis. *Am J Public Health* 1994;**84**:1086–93.
2 **Rebagliato R**. Validation of self reported smoking. *J Epidemiol Community Health* 2002;**56**:163–4.
3 **Erens B**, Primatesta P, eds. *Health Survey for England '98*. London: Stationery Office, 1999.
4 **Vartiainen E**, Seppala T, Lillsunde P, *et al.* Validation of self reported smoking by cotinine measurement in a community study. *JECH* 2002;**56**:167–70.
5 **Boyd NR**, Windsor RA, Perkins LL, *et al.* Quality of measurement of smoking status by self-report and saliva cotinine among pregnant women. *Maternal and Child Health Journal* 1998;**22**:77–83.
6 **Owen L**, McNeill. Saliva cotinine as indicator of cigarette smoking in pregnant women. *Addiction* 2001;**96**:1001–6.
7 **Campion P**, Owen L, McNeill A. Smoking before, during and after pregnancy in England. *Health Educ J* 1994;**53**:163–73.
8 **Penn G**, Owen L. Factors associated with continued smoking during pregnancy: analysis of socio-demographic, pregnancy and smoking-related factors. *Drug and Alcohol Review* 2002;**21**:17–25.
9 **Feyerabend C**, Russell MAH. A rapid gas-liquid chromatographic determination of cotinine in biological fluids. *Analyst* 1980;**105**:993–1001.
10 **Jarvis MJ**, Tunstall-Pedoe H, Feyerabend C, *et al.* Comparison of tests used to distinguish smokers from non-smokers. *Am J Public Health* 1987;**77**:1435–8.